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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,223	11/26/2001	Kenichi Kurisu	50395-125	6863

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EXAMINER
VINH, LAN

ART UNIT	PAPER NUMBER
1765	7

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/993,223	KURISU, KENICHI
	Examiner	Art Unit
	Lan Vinh	1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 May 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *09/993223*.

3☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 6
4)☐ Interview Summary (PTO-413) Paper No(s). _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443)

Narui discloses a method for forming a light emitting device/optical element having a layer that makes diffraction grating (col 2, lines 31-34). This method comprises the step of etching a pattern in a ZnSe layer 10 by RIE method using a gas of boron trichloride (BCl_3) (col 5, lines 55-56; col 6, lines 26-28), which reads on RIE a pattern in a ZnSe substrate by means of only chlorine-based gas which does not include a hydrocarbon group.

Unlike the instant claimed invention as per claim 1, Narui does not disclose that the ZnSe substrate is a polycrystalline substrate

However, Biricik, in a method of manufacturing optical semiconductor windows, teaches forming a polycrystalline ZnSe substrate (col 15, lines 33-34)

Since Narui is concerned with a method of forming an optical element, one skilled in the art would have found it obvious to modify Narui method by forming a polycrystalline ZnSe substrate as per Biricik because Biricik teaches that polycrystalline ZnSe are preferred substrates for optical transmission (col 15, lines 32-34)

The limitation of claim 4 has been discussed above.

3. Claims 2, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443)

Narui discloses a method for forming a light emitting device/optical element having a layer that makes diffraction grating (col 2, lines 31-34). This method comprises the step of etching a pattern in a ZnSe layer 10 by RIE method using a mixed gas of boron trichloride (BCl_3) and He/helium/inert gas (col 5, lines 55-56; col 6, lines 26-28), which reads on RIE a pattern in a ZnSe substrate with a mixture of a chlorine-based gas which does not include a hydrocarbon group and inert gas

Unlike the instant claimed invention as per claim 2, Narui does not disclose that the ZnSe substrate is a polycrystalline substrate

However, Biricik, in a method of manufacturing optical semiconductor windows, teaches forming a polycrystalline ZnSe substrate (col 15, lines 33-34)

Since Narui is concerned with a method of forming an optical element, one skilled in the art would have found it obvious to modify Narui method by forming a polycrystalline ZnSe substrate as per Biricik because Biricik teaches that polycrystalline ZnSe are preferred substrates for optical transmission (col 15, lines 32-34)

The limitation of claim 7 has been discussed above

4. Claims 3, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443) and further in view of Collins (US 5,707,486)

Narui as modified by Biricik has been described above in paragraph 3. Narui and Biricik differ from the instant claimed invention as per claim 3 by using an inert gas of helium instead of argon.

However, Collins, in a process of plasma etching/RIE etching, teaches that an inert gas such as argon and helium can be added to the etching gas chemistry (col 18, lines 9-11)

Since Narui is concerned with a step of RIE etching, one skilled in the art would have found it obvious to substitute Narui and Biricik inert gas of helium with argon in view of Collins's teaching because both gases are known inert gases and Collins states that argon is the preferred inert gas additive, because it is relatively massive and thus contributes to the sputter etch component of the RIE process (col 17, lines 32-35)

The limitation of claim 8 has been discussed above.

5. Claims 5, 9, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443) and further in view of Harafuji (US 5,635,021)

Narui as modified by Biricik has been described above in paragraph 3. Unlike the instant claimed invention as per claims 5, 9, 10, Narui and Biricik do not specifically disclose performing the RIE etching at a gas pressure of 0.5 Pa through 1 Pa.

However, Harafuji, in a method of dry etching using RIE, teaches setting the gas pressure of a chlorine-based gas such as BCl_3 at a pressure of 0.1-20 Pa (overlaps the claimed range of 0.5-1 Pa) during RIE etching (col 38, lines 55-61)

Since both Narui and Harafuji are concerned with RIE etching step using chlorine-based gas, one skilled in the art would have found it obvious perform Narui and Biricik's RIE etching step at a pressure range as taught by Harafuji especially since Harafuji states that when other plasma internal parameters than the gas pressure are constant, the spread of the ion angular distribution can be controlled to a certain degree by changing the gas pressure of about 1 Pa (col 20, lines 64-67)

6. Claims 6, 11, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Biricik et al (US 5,173,443) and further in view of Kim et al (US 6,037,267)

Narui as modified by Biricik has been described above in paragraph 3. Unlike the instant claimed invention as per claims 6, 11, 12, Narui and Biricik do not specifically disclose activating the gas by means of radio frequency (RF)

However, Kim discloses a method of etching using RIE etching comprises the step of supplying RF (radio frequency) coil power to the upper electrode to excite the species of the gas (col 4, lines 38-41),which reads on activating the gas by means of radio frequency (RF)

Since Narui is concerned with RIE etching step, one skilled in the art would have found it obvious to modify Narui and Biricik RIE etching step by activating the gas by

means of radio frequency (RF) as per Kim because according to Kim the coil RF power also constrains the electron to orbit in a plasma region away form the chuck, the electrons of the plasma then interact with other species of the etching gas to form ions and radicals (col 4, lines 42-45)

Response to Arguments

7. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 703 305-6302. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.

LV
July 10, 2003